

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Financial Aspects of the United States Pension System

Volume Author/Editor: Zvi Bodie and John B. Shoven, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-06281-3

Volume URL: <http://www.nber.org/books/bodi83-1>

Publication Date: 1983

Chapter Title: Economic Implications of ERISA

Chapter Author: Jeremy I. Bulow, Myron S. Scholes, Peter Menell

Chapter URL: <http://www.nber.org/chapters/c6027>

Chapter pages in book: (p. 37 - 56)

Economic Implications of ERISA

Jeremy I. Bulow, Myron S. Scholes,
and Peter Menell

2.1 Introduction

On enacting the Employee Retirement Income Security Act (ERISA) in 1974, Congress changed the ownership rights to the assets of defined-benefit pension plans. These ownership rights were changed through the establishment of the benefit insurance program, the definition of fiduciary responsibility of plan administrators, and the minimum vesting and benefit accrual standards for plan beneficiaries.

If, in part, the intent of ERISA was to assure that the beneficiaries of virtually insolvent pension plans would receive adequate pension benefits, in recent years sharp increases in nominal rates of interest have blunted the extent of the impact of this policy. The enactment of ERISA created a huge liability to pay pension benefits, a liability that fell on the Pension Benefit Guaranty Corporation (PBGC), the agency established to insure pension benefits on the termination of corporate pension plans. As rates of interest rose, however, the PBGC found that the present value of its liabilities fell sharply, and that it no longer faced the likelihood of a funding crisis: it no longer faced a significant threat of multiple terminations of underfunded pension plans. Naturally, the PBGC will continue to guarantee its share of the benefits of the plans of corporations entering bankruptcy. Although significant in dollar amounts, these liabilities are small relative to the value of the claims on the PBGC on the enactment of ERISA.

Jeremy I. Bulow is associate professor, Stanford University Graduate School of Business, and a faculty research fellow of the National Bureau of Economic Research. Myron S. Scholes is Edward Eagle Brown Professor, Graduate School of Business, University of Chicago, and research associate, National Bureau of Economic Research. Peter Menell is affiliated with the Economics Department of Stanford University.

We thank the participants at the NBER Conference on Public and Private Pensions for their comments, especially Fischer Black and Richard Zeckhauser.

Under ERISA, rules constrain the uses of the assets in the pension fund; rules constrain the way the assets in the pension fund are managed; rules require audits and reports to government agencies, and rules require that insurance premiums be paid to the PBGC. The defined-benefit pension plan, however, remains as a viable alternative to other types of pension plans, such as a defined-contribution pension plan, the major competing alternative that is not subject to ERISA limitations. Balancing the increased costs of ERISA are rules that allow overfunding of the pension fund. By overfunding, the firm's stockholders earn the before-tax rate of return on the overfunded portion of the assets in the pension fund. With higher rates of interest, and with prospects in the late seventies and early eighties for decreasing corporate rates of tax, employers had powerful tax incentives to retain and to overfund defined-benefit pension plans. In addition, when the rules under ERISA were defined, revised, and understood, adjustment to them was relatively inexpensive, and in the end there were still as many "loopholes" with nearly as much potential to skew benefit accruals as before ERISA.

Although increases in the rate of interest limited the impact of ERISA by reducing the present value of pension liabilities, ERISA would have had an enormous impact if interest rates had remained unchanged or had fallen after the enactment of the Act. Without the reduction of pension liabilities, as a result of unexpected and high rates of interest, the PBGC would have faced a plight analogous to the plight that confronts the Federal Savings and Loan Insurance Corporation (FSLIC) with the same unexpected and high rates of interest. If interest rates had fallen in the late seventies, the liabilities of many plans would have increased to such an extent that employers would have had a far greater incentive to terminate their pension plans and pass the liabilities of their plans on to the PBGC. With the PBGC forced to assume these liabilities, its likely first response would have been to raise premiums. For employers with overfunded plans, however, increased premiums coupled with low rates of interest would have reduced the relative tax advantage of retaining defined-benefit pension plans. For the insurance system to have remained solvent, employers with overfunded plans would have had to agree to increase the subsidy to employers with underfunded and terminated plans. Faced with this prospect, many employers with overfunded plans would have selected out of ERISA coverage by switching to defined-contribution plans. Thus, a dramatic change in the Pension Reform Act would have been needed to prevent the ultimate collapse of the Pension Benefit Guaranty Corporation. Given the current opportunity, however, modest changes in the pension law could rectify the structural problems that could again cause damage, changes in the law that would reduce the value of terminating a pension plan.

In the first section of the chapter, we examine the economics of the pension funds and pension funding before the enactment of ERISA. We discuss the fundamental differences between plans that are overfunded and plans that are underfunded. We discuss possible reasons for establishing a defined-benefit plan and how these reasons affect corporate funding policy. The post-ERISA environment is analyzed in the second section of the chapter. The crucial plan termination rules are presented. We show how the effects of ERISA are different for overfunded plans than for underfunded plans. We emphasize the importance of the effects of changes in rates of interest to an understanding of the long-term economic effects of ERISA. In the final section, we analyze several approaches to changing the current pension law that could prevent future difficulties and provide viable long-term benefit insurance.

2.2 Defined-Benefit Pension Funds before ERISA

2.2.1 Pension Liabilities

Prior to the enactment of ERISA, pension liabilities were not liabilities of the firm. When a plan terminated, beneficiaries had claims on the assets of the pension fund only; if funds were insufficient to cover accrued liabilities, the beneficiaries of the plan had no recourse to the general assets of the firm. Whether terminating the plan caused redistribution from one group of participants to others or from participants to stockholders is ignored at this stage of the analysis. We assume that all parties have worked out arrangements to try to protect themselves against adverse agency problems.

When a plan terminated, the priority of claims on the assets in the fund was determined by the rules of the plan; for example, already retired workers might have had priority over active workers in the firm. The aggregate claim of all the beneficiaries could be expressed as:

$$(1) \quad T = \min(F, V)$$

where T = benefits of beneficiaries if plan terminated, F = value of assets in the pension fund, and V = present value of vested benefits, discounted at the risk-free nominal interest rate. The claims of the pension beneficiaries could be looked at in two equivalent ways: (1) the beneficiaries “owned” the assets in the pension fund, but management had the option to call the assets in return for paying off the vested benefits of V , or (2) the stockholders “owned” the pension assets but had the right to “put” them to the participants in the plan in satisfaction of their claim V against the firm. To understand the value of these options, it was necessary to consider the interests of both the employer and the employee group, for

example a union, in negotiating a new short-run labor contract when confronting a pension plan that was underfunded as contrasted to one that was overfunded.¹

2.2.2 Underfunded Plans

Difficulty in Running an Underfunded Plan

Although there were circumstances under which plans could remain underfunded for long periods of time, pressures did exist for employers either to fund or to terminate defined-benefit pension plans. For a plan to remain underfunded required two important and sustainable conditions: (1) workers negotiated their salaries and benefits not individually but as a group, and (2) workers possessed firm-specific human capital—the present value of rents expected to be earned through future employment—that capital being greater in value than the value of the underfunding. To show that these were sufficient conditions, we will consider all four possible combinations of “worker negotiation” and “human capital.”

Let

f_i = pension benefits to worker i if the plan terminates.

v_i = benefits to worker i on leaving the firm assuming the plan continues and pays off all vested benefits.

p_i = opportunity cost of worker i (present value of future compensation from alternative employment).

m_i = present value of future marginal product of worker i .

F = total amount of money in pension fund, ($\sum f_i$).

V = present value of vested benefits, ($\sum v_i$).

P = total worker present value, ($\sum p_i$).

Individual Salary Negotiations and No Firm-Specific Human Capital

If the plan were never terminated, worker i would still earn p_i on leaving the firm but retain v_i in already accumulated pension benefits. Therefore, if the employer were to assure their pensions, workers would expect total future payments worth $P + V$. If the firm terminates the pension plan, however, the cost of its work force would be less, only $P + F$: each would receive a termination benefit of f_i and a salary of p_i . The employer has an incentive to terminate the underfunded pension plan.

Individual Salary Negotiations and Firm-Specific Human Capital

If the plan would never terminate, future compensation (including payouts of already earned pension benefits) would be negotiated as an amount between $p_i + v_i$ and $m_i + v_i$ for each worker. If the plan terminates, however, each worker receives only f_i and future compensation is bargained between p_i and m_i . Because $f_i \leq v_i$, under any standard bargaining solution, the employer would have at least as low a cost terminating the pension plan as continuing it.

Group Salary Negotiations and No Firm Specific Human Capital

With group negotiations and no firm-specific human capital, workers would not expect to receive more than $P + F$, the amount they would receive in pension benefits on termination of the underfunded pension fund. If the workers, however, were to believe that the plan would never terminate, and that they would receive v_i in benefits if they quit, they would stay with the firm only with a contract to pay each of them $p_i + v_i$, or a total of $P + V$. Therefore, the total cost to the firm would be greater continuing the underfunded plan. The only way that not terminating the plan could be profitable is if the firm could find a way, albeit unlikely, to maintain an equilibrium, where unfunded benefits ($V - F$) could somehow continue to grow at least at the interest rate.

Group Salary Negotiations and Firm Specific Human Capital

Assume that the workers, as a group, possess some firm-specific human capital. Define M as the present value of the workers' future output. $M \geq \sum m_i$, such that the marginal product of the total work force is greater than the sum of the marginal products of the individual workers (e.g., if a few workers were to quit there would be little if any loss, but if all the experienced workers left the firm there would be a large loss to the firm). With group bargaining, the threat point for the workers would be $P + F$, the amount they would earn if no new contract were signed and the plan terminated. Employers would be willing to pay no more than $M + F$; otherwise, terminating the plan and hiring new workers would be the better alternative. Individual workers, recognizing that the plan would continue, leave unless they receive at least $p_i + v_i$, or at least $P + V$ in aggregate. Although the final compensation package must be worth no less than $P + F$ and no more than $M + F$, it is conceivable that the package could be worth more than $P + V$. The firm need not terminate the plan. To value the liabilities of the pension plan, however, we can still use the value of the plan on a termination basis. The bargaining position of the firm is not impaired by the workers' knowing that the plan will never terminate.²

This analysis implies that salaried workers, who do not bargain explicitly as a group, are more likely to have pension funds that are funded than do union workers, who do bargain as a group. This is consistent with historical data. Even firms with difficult plans for salaried and for hourly workers invariably have better funded plans for the salaried workers.

Claims on Underfunded Plans

For simplicity, start by considering a plan that is so underfunded that there is no chance that F will exceed V by the end of the next labor contract. If no new contract is signed, and if the plan is terminated, the workers receive the money in the fund, F . If a new contract is signed, the value of the workers' claims at the end of the contract will be the value of

the assets in the fund at that time: the value is a function of firm contributions, investment policy, and disbursements. In this situation, the firm's claim against the assets of the pension fund is of little, if any, value. The firm is concerned only with the contributions it is required to make to the plan in lieu of current salary to the workers.

The firm should be interested in negotiating only the pension contribution and should not be interested in the investment policy or the increases in vested benefits granted under the new contract. The only points on the "contract curve" involve the workers' setting investment and benefit policy however they please for "their" fund.³

Empirical work on testing these effects seems to bear out this analysis. Inman (1980), in a study of municipal pension plans, estimated that there is a significant difference between how workers value extra vested benefits in greatly underfunded plans and how they value benefits in well-funded plans. They ascribe little value to promises of increased benefits if their plan is underfunded.

Anecdotal evidence also supports this view. For example, as part of their financial concessions to a hard-pressed New York City, union representatives allowed the city, albeit for possible other payments, to buy city securities with the assets in the union pension funds and to do so at more than market prices. If the fund were overfunded the workers would have valued their pension as V , the vested benefits, and the reduction of the value of the assets in the pension plan would have been costless for them and of no benefit to the city. That the employees and the city officials felt that the purchase of city bonds at below market rates of interest was a genuine concession indicates that the value of the claims in underfunded plans depends crucially on the value of the fund, F .

Summary of Underfunded Plans

Before ERISA, when F was far below V , contract negotiations centered on contributions to the fund. Workers gained when the value of the fund increased and lost when the value of the fund decreased. The fund belonged to the workers. Although the value of vested benefits, V , was computed by discounting vested benefits at the riskless rate of interest, and V changed with changes in interest rates, a change in V might not have implied a transfer of assets to either the firm or the workers.

2.2.3 Overfunded Plans

The second polar case concerns a plan that was well funded and could cover its vested benefits. Since the minimum of F and V was V , negotiations centered on granting additional benefits, increasing V . For these plans, employees were not concerned with changes in the assumed interest rate; they were not affected by a reduction in contributions to the pension fund—benefits would still have been valued at V despite the

inframarginal reduction in F . Plan participants were not concerned with the investment policy of the fund; the stockholders, however, as residual claimants were concerned with investment policy.

In an overfunded plan the risk of the plan, (risk in F), was borne by the stockholders of the firm. The value of the pension claims, V , remained approximately the same with changes in the value of the assets in the plan. Unanticipated changes in V , however, mainly due to changes in interest rates, represented transfers between the employees and the stockholders.

2.2.4 Why Have a Defined-Benefit Pension Plan?

Defined-benefit pension plans are more complicated to analyze than defined-contribution pension plans. There is little literature on valuing pension liabilities in a defined contribution plan—everyone knows that at any given time the value of a pension in a defined-contribution plan is simply the amount of wealth currently in the plan. No complicated actuarial methods are needed to allocate defined-contribution pension costs—simply, the costs in any year are the contributions for that year. The valuation of defined-benefit pension liabilities, however, has received significant attention over the past five years, and there still is uncertainty about the correct method to value these benefits.

Given that defined-benefit plans are complicated, why do so many firms use these plans? Prior to ERISA, there were at least four reasons why it was in the interests of corporations to use these plans. First, defined-benefit plans were used to shelter income from the corporate tax. A defined-contribution plan is always funded fully—never overfunded or underfunded. If there is a tax advantage to overfunding a pension plan, the advantage could only be gained through having a defined-benefit plan.

How the tax advantage to overfunding the pension plan comes into being depends on the model of capital market equilibrium. Since in a Miller (1977) model there is no advantage to issuing corporate debt—in equilibrium the effective personal and corporate brackets are the same—the tax advantage arises from holding bonds in the pension fund that earn at the pretax corporate rate. In the “debt capacity” model, the tax advantage comes from issuing debt on corporate account. Holding extra assets in the pension fund increases debt capacity. In addition, with expectations of a falling corporate tax rate, there is an incentive to overfund the plan, at least for corporations paying taxes.

Before ERISA, however, the annual tax savings possible through overfunding were limited. Nominal interest rates were low, and prospects were not as bright for a reduction in the corporate rate of tax. With low rates of interest it was difficult to understate the interest assumption to increase the funding of the plan. Additionally, the incentive to accelerate

contributions to a pension plan was significantly less than with high rates of interest.

It was, however, relatively easy to move money into and out of a pension fund—there were no minimum funding standards. Since the tax advantage of overfunding belonged to the stockholders, the ease of moving the excess between the pension fund and the corporate account made the location of the money important only for tax purposes. There were many examples of firms moving money into and out of their plans (e.g., U.S. Steel in 1955).

Second, a defined-benefit plan can be used to leverage total compensation. Since pension benefits are tied to final average salary, an increase in salary of 1% can increase total compensation (pension plus salary) by more than 1%.

Third, there may be information conveyed by the form of the pension plan. For example, workers might receive early retirement benefits in lieu of severance pay. With a defined-benefit plan, the firm accumulates severance pay in a tax-free account, and formalizes the arrangement with workers. Workers, leaving the firm early, know what severance pay they will receive and that they will earn it whether they quit or are fired by the firm.

As a last point, Bulow (1982) has shown that most accruals of benefits in a pension fund are credited to the older workers. The defined-benefit plan provides an easy way to skew pension compensation toward older workers while still appearing to be somewhat evenhanded in the treatment of all workers. Although no one is necessarily fooled by this approach, older workers do tend to save more for retirement than younger workers. It is extremely difficult to skew benefits in a defined-contribution plan. Expanding on this theme, some have argued that these plans, being complicated, have been used to fool workers and government officials and to smoothe corporate earnings.

2.2.5 Summary of Pre-ERISA Environment

Before the enactment of ERISA, workers in effect owned the assets of the underfunded pension plans; the stockholders owned the assets in excess of funding requirements in the overfunded pension plans. Only the plans for organized labor could remain underfunded for any length of time without being terminated.

The overfunded plans, on the other hand, could be used to shelter funds from tax for it was fairly easy to move funds between the pension fund and the corporation, and vice versa. The tax advantage, however, was seldom great; interest rates before 1974 were relatively low. In addition to any tax advantage, defined-benefit plans could be used to lever compensation, to accumulate a form of severance pay, or to skew pension compensation toward older workers.

2.3 Defined-Benefit Pension Plans after ERISA

With ERISA, the legal claims of beneficiaries and of employers changed. Most important was the introduction of a form of plan termination “insurance” that guaranteed approximately 85% of all vested benefits. With this insurance, beneficiaries of underfunded plans, mostly members of organized labor, gained at the expense of the PBGC. If interest rates had not risen, sharply reducing the value of these claims, the PBGC would have faced many more plan terminations than actually have occurred since the enactment of ERISA. To understand how to reform the rules and to prevent a possible collapse in the future, we will explain the economic effects of the rules for terminating a pension plan.

In addition to promulgating the rules for terminating a plan, ERISA also tightened the standards that apply to a fiduciary managing a pension fund. A major effect of these changes has been to restrict the movement of assets to the corporation from the pension plan. With these restrictions it became more costly to overfund and to pull back the funds as needed, just as the level of the interest rate made it more advantageous to overfund the plan. ERISA, however, failed in taking aim at curtailing “backloading”—the skewing of benefit accruals toward long-term employees.

2.3.1 Pension Liabilities after ERISA

We use the following notation to describe the rules mandated by ERISA: A = accrued benefits, G = guaranteed benefits, E = “net worth” of the firm, F = value of the assets in the pension fund, T = value of the worker’s claim on termination of the fund, $PBGC L$ = liability of PBGC on termination of the fund, and FL = liability of firm on termination of the fund.

Accrued benefits are the sum of vested and nonvested benefits. Guaranteed benefits differ from vested benefits in several respects: (1) there is a maximum to the amount guaranteed each worker in the plan; (2) the guarantee of benefits arising from an amendment to a plan is phased in over 5 years (ERISA, Sec. 4022[b][1] and [8]); (3) ancillary benefits such as death benefits are not guaranteed; and (4) the PBGC is not required to grant lump sum payments or early retirement benefits if the present value of these benefits exceeds the present value of normal retirement benefits (PBGC Opinion Letters 75-33 and 77-141). From current PBGC experience, it guarantees approximately 85% of the vested benefits of employees in covered plans that were terminated with deficits.⁴

Under ERISA Section 4062, the employer maintaining an underfunded plan at termination is liable for up to 30% of the “net worth” of the corporation. This section states that “net worth is determined on whatever basis best reflects, in the determination of the Corporation

(PBGC), the current status of the employer's operations and prospects at the time chosen for determining the net worth of the employer." The PBGC appears to be able to use any method of valuation to secure its guarantees. Under ERISA, then,

$$(2) \quad T = \max[G, \min(A, F)]$$

$$(3) \quad FL = \min\{A - F, \max[0, \min(G - F, .3E)]\}$$

$$(4) \quad PBGCL = \min(0, F + .3E - G).$$

Note that $T - FL - PBGCL = F$; the total value of all claims against the fund add to the amount in the fund.

Overfunded Plans

If a plan is overfunded, $F > A$, ERISA has little direct impact other than the requirement that the employers pay annual insurance against plan termination (currently \$2.60 per employee). The main impact of the Act was to require employers to adhere to rigorous standards when acting in the capacity of a fiduciary for the defined-benefit plan. Although the firm owns the excess assets in the fund, it is restricted greatly in its ability to use these assets. ERISA Section 4044 (d)(1) states that any residual assets in a terminated plan revert to the employer only if the pension plan explicitly provides for such a distribution in termination. Thus, in many cases the PBGC has contended that excess assets should go to plan beneficiaries. Despite these restrictions, employers are still able to withdraw funds from pension plans by at least the following indirect methods: (1) by making small reductions each year in the amounts contributed to the plan; (2) by increasing the fraction of total compensation in the form of promised pensions; or (3) by increasing early retirement benefits. These routes, however, are not as clear-cut and fast as some might like, especially the creditors of the firm.

Underfunded Plans

ERISA brought about major changes for plans that were underfunded, that is, plans for which $F < A$. Beneficiaries of plans that were underfunded to the extent that the PBGC would bear some residual liability on termination, $(F + .3E < G)$, and that applies mainly to union plans, found that their benefits were raised to G : an amount independent of the assets in the plan. The PBGC assumed the risk of a default, while previously union members bore this risk. A literal interpretation of the rules implies that a firm can terminate its plan and require that the PBGC pay up the amount $G - F - .3E$ to members of the union. The firm has an option to terminate its plan; the exercise value of the option is the $\max(0, G - F - .3E)$. Although the pension put may be valuable, the PBGC can reduce its value to zero by requiring the firm to shore up the plan or by taking over the plan as soon as G exceeds F or the put becomes

valuable. The PBGC, however, may not move quickly to take over a firm because of the cost of assuming 30% of the equity of the firm or the cost of reorganizing the firm. This has resulted in a degree of uncertainty about how the PBGC responds when a pension fund becomes greatly underfunded. The PBGC may forbear for a period of time and not act to shut down the plan: the put option becomes difficult to value.

2.3.2 Why Not Terminate a Defined-Benefit Pension Plan?

By enacting ERISA, Congress made the PBGC immediately liable for the unfunded guaranteed benefits that could not be covered by 30% of a firm's net worth. For those firms with overfunded plans, the insurance premium is akin to a tax, unless there was an expectation that the PBGC would forbear in the future or that the plans had benefits over defined-contribution plans that exceeded the insurance costs. Since the PBGC does forbear, the reasons that a plan does not terminate include: (i) the firm loses the possibility of being liable for less than 30% of its "net worth"; it may be more profitable to hold its option than to exercise it; (ii) "cash flow" considerations make continuation for the coming period profitable. To show this, let G_t , G_{t+1} = value of guaranteed benefits in periods t and $t+1$; D_{t+1} = dividends paid by the firm in period $t+1$; P_{t+1} = payouts by pension fund of guaranteed benefits in period $t+1$; r = riskless rate of interest; and C_{t+1} = contributions to the plan in period $t+1$. Then if

$$(5) \quad G_{t+1} + P_{t+1} - (1+r)G_t + D_{t+1} - C_{t+1} > 0,$$

it pays to delay termination, even if termination is likely to occur in the future. The pension compensation from continuing the plan another period, $G_{t+1} + P_{t+1} - (1+r)G_t$, and the reduction in the value of the PBGC's equity claim through dividend payouts exceed the required pension contribution of the firm. By continuing the plan, the workers and stockholders both gain at the expense of the PBGC.

The value of the reputation of a firm might also make managers pause before terminating a plan. For an overfunded plan there is no problem. Other pension benefits could be substituted and employees would be as well off as with the defined-benefit plan. With an underfunded plan, a termination, with a surrender of 30% of the net worth of the firm, might result in a backlash from its workers, from its customers, and from its creditors.

Difficulties in Applying ERISA

Although the potential for huge plan terminations existed in the mid-seventies, there were fewer terminations than the analysis might suggest. On the enactment of the Act, according to a strict interpretation of the rules of ERISA, the PBGC had a large and mostly unfunded liability. To

some extent, the PBGC may have been slightly better off because it was ambiguous whether a firm could terminate an underfunded pension plan, give up 30% of its net worth, and continue in business. It was also unclear what the latitude of the PBGC was in defining what constitutes "net worth." In PBGC opinion letter 80-5, a subsidiary of a firm submitted a request for waiver of liability on terminating an underfunded plan because it had negative worth. The waiver was denied on the grounds that the parent of the subsidiary showed adequate book and retained earnings. In that opinion letter, the PBGC argued that in determining the net worth of a business it could look beyond book value and use other factors to establish the value of the business as a going concern. In PBGC opinion letter 80-6, the PBGC stated that "net worth," as used in Section 4062(b) of ERISA, refers to an employer's fair market value, which in many cases may differ significantly from an employer's balance sheet or appraised value. Naturally, the PBGC has argued that in passing ERISA, the intent of Congress was not to bail out underfunded pension plans. One important case involved Alloytek, a firm that attempted to terminate its underfunded pension plan and to start a new plan with the exact same benefits as the current plan. The firm had a negative book value, and the shares of its stock were not traded; the firm argued that its "net worth" was zero. The issue was whether a going concern can terminate an underfunded plan at the expense of the PBGC. The settlement of the case was highly favorable to Alloytek and should lead to some immediate reforms in the pension law.

The definition of net worth is a major issue of current pension fund litigation. There is enough ambiguity in interpreting "net worth" to make it unclear what "net worth" really applies in defining the liability of the firm. For example, Penn-Dixie, a bankrupt firm, negotiated a large payoff to the PBGC as part of its plan of reorganization. Even with a bankrupt firm the PBGC may have a claim closer to that of a creditor than that of an equity owner. This claim as a creditor may arise because the firm often violates a provision of ERISA if it is near bankruptcy; for example, by falling behind in contributions.

Another major issue of definition arises in picking a rate of interest at which to discount the future benefits to calculate the guaranteed benefits, *G*. The PBGC calculates its interest rates using a survey of annuity rates offered by major insurance companies, subtracts the expense and profit rates of the insurance company, and adjusts for its own expense rates. On terminating plans, employers have the following options: (1) let the PBGC take over the assets of the plan along with the liabilities; (2) value the liabilities according to PBGC rates, or (3) buy out some of the liabilities through private contracting with insurance companies. Even though the PBGC rates of interest are below market rates, increasing the

value of the guarantees, most employers have opted to have the PBGC take over the assets and liabilities of their plans.

We suspect the reason for this is that many of the plans that have terminated were the smaller plans, for which an insurance company would add administrative charges to the rate of interest to cover its own expenses. If a large plan terminates it may do better by buying insurance in the market; if not, the low interest rate assumptions have interesting implications. Using a low rate of interest overstates the value of the guaranteed benefits. By overstating these benefits the PBGC can force a firm with insufficient assets in the pension fund to pay up a greater percentage of the value of its equity (up to 30%) on terminating the pension fund. Terminating a pension fund may be more costly than the rules suggest.

2.3.3 Summary of Effects of ERISA on Underfunded Pension Plans

By guaranteeing the pension benefits, ERISA transferred resources to the beneficiaries of underfunded pension plans. This transfer came partly at the expense of the equity holders of the firm, up to 30% of the security of their equity value, and partly at the expense of the PBGC, which is required to make up the difference between guaranteed benefits and the liability of the firm. In the short run, underfunded plans would not have had an incentive to terminate because of the value of the "put" option. A plan termination under ERISA, however, does not imply that an employer abrogates pension obligations to its employees. It may mean simply that the firm changes to a different type of plan (e.g., a defined-contribution plan). Thus terminating a plan is not necessarily a major disruption within the firm; it may have no effect on the reputation of the employer.

Most terminations were by fully funded plans. This does not mean that the PBGC was financially sound at its creation. Remember that increases in rates of interest reduced the present value of the promise to the beneficiaries of pension plans guaranteed by the PBGC. At the end of 1980, using a sample of 682 large corporations with defined-benefit plans, we found that only five firms had liabilities that would require PBGC payments. The five were Chrysler, Uniroyal, Wheeling-Pittsburgh, Braniff, and Cyclops. (Our sample did not include International Harvester, and Braniff has declared bankruptcy.) To estimate the liability, we used 1980 year-end market values of the firms in the sample, an 11% rate of interest, and the current relation between guaranteed benefits and reported benefits, $G = .85 V$ (firm rate of interest/.11)⁷⁵. We were forced to use the consolidated liability, V , in making these estimates because some firms have both a union and a salaried plan where union plans tend to be vastly underfunded and salaried plans are usually well funded (e.g.,

Chrysler). Consolidation understates the liability of the PBGC. Nevertheless, interest rates have limited the problem of the PBGC to only a few firms. In fact, using only the assets in their pension plans to cover the guarantee, only 25 pension plans had guaranteed benefits in excess of the assets in the plans. Therefore, even with bankruptcies of a few major firms, it becomes clear why the frequency of savings and loan association bankruptcies and the status of the FSLIC were salient issues in public policy relative to the solvency of pension plans and the PBGC's ability to guarantee benefits in the early 1980s.

An interesting side effect of the ERISA guarantee is that negotiations of new labor contracts have switched their emphasis from contributions to benefits. Before ERISA, the union would have rejected a Chrysler plan to postpone indefinitely making any contributions to the pension plan. Recently the firm negotiated such delays for its underfunded hourly plan without objection. Negotiations are primarily over benefits that increase the amount of the guarantee.

2.3.4 Summary of Effects of ERISA on Overfunded Plans

One major effect of ERISA has been to increase the cost to the employer of using defined-benefit plans. Insurance premiums are required, and the new fiduciary rules make defined-benefit pension plans less flexible. Balancing this, however, are tax advantages of overfunding a defined-benefit pension plan. Whenever rates of interest are high or prospects for tax rates are lower, employers have an incentive to continue using a defined-benefit pension plan.

A firm can increase the amount of overfunding in the plan simply by not altering its assumptions about the rate of interest used to calculate the present value of the benefits. Although IBM, for example, is approximately fully funded on its books, IBM uses only a 5.5% rate of interest. Using current interest rates, its pension plan is overfunded by approximately \$3 billion. Because firms assume low interest rates and modify these assumptions infrequently, increases in the market rate of interest tend to increase the amount of overfunding possible in a plan.

Balancing the benefits of overfunding, however, are the new rules that fiduciaries must follow in managing the assets of the fund. These rules obscure the ownership of the excess assets in the pension fund. ERISA has made it more difficult to borrow against the assets in the pension fund. Some firms thus may be reluctant to overfund, and this may help explain why many firms reduce their accumulations in the fund by changing their actuarial assumptions even though they did not need to make the change. About 15% of the more than 1,000 firms subject to FASB inflation-accounting rules of disclosure changed their actuarial assumptions in 1980, though not all changed their interest rate assumption.

2.3.5 Ineffectiveness of Other ERISA Provisions

ERISA requires that pensions of employees vest according to minimum vesting rules. Another stated objective of ERISA is to minimize the backloading of benefits. "Backloading" is the practice of having a benefit formula that biases the pension benefits in favor of the long-term employees. For example, a plan might give a worker a pension equal to one-half of one percent of final salary times the number of years worked up to 20 plus 2% of salary times the number of years worked beyond the 20 years. Under current law, however, the annual rate of accrual cannot be more than $\frac{4}{3}$ as great in future years than in the current year (ERISA Sec. 204 [b][1][B]).

It is still possible, however, to backload. Backloading of a substantial amount can occur by using the rules for integration with social security and by using the high interest rates. As shown by Bulow (1982), if the provisions of a plan state that a worker will receive a fixed percentage of final salary times the number of years worked, then pension accruals are highly skewed toward the last years with the firm. McGill (1977) explains that by using the formulas for integrating social security with pension benefits under ERISA, a disproportionate share of the accrued benefits of any worker leaving the firm at a young age or any worker leaving after a short duration can be eliminated by integration with social security. Although it is easy to skew benefits in a defined-benefit plan, it is difficult to skew benefits in a defined-contribution plan. The designers of pension plans might use this feature to better fashion the plan to the needs of the beneficiaries.

2.4 Possibilities for Reform of ERISA

The PBGC has a direct interest only in plan funding, portfolio allocation, and benefit accrual decisions: these decisions affect the value of the "pension put." As we have discussed, the pension put is currently "out of the money" for all but a few plans. Modest changes in the funding and portfolio allocation rules will ensure that the PBGC will not be as vulnerable to plan terminations as it was in the mid-1970s.

Under ERISA, the PBGC technically has the power to terminate any plan as soon as it feels there is a danger that if a plan terminates it would be liable to pay benefits (ERISA Sec. 4042[a]). Since the exercise value of the pension put to the corporation is $\max(0, G - F - .3E)$, the PBGC, by following the mandate literally, could make the value of the pension put equal to zero by terminating the plan when $G = F + .3E$. If such a policy were followed, pension insurance would be of no value to most firms. The only reason that firms would continue to pay the insurance premium

would be to maintain the tax advantage of a qualified defined-benefit pension plan.

Actually, the PBGC has a policy of forbearance: it does not terminate many plans. In any event, it would probably have some difficulty in the courts if it tried to terminate a plan that was meeting the minimum ERISA funding standards. Also, the PBGC is not equipped to take over large numbers of pension plans, nor does it view the taking over of plans as being the intent of Congress.

If the PBGC does forbear in not terminating plans, its role changes to that of the pension fund monitor. As a price for not immediately terminating insufficient plans, the PBGC could require funding and investment policies that reduce the value of the pension put or at least keep it from becoming too valuable. Three types of changes can protect the PBGC, and they will not interfere to any extent with the management of the pension fund.

First, the PBGC could require better matching of pension fund assets and liabilities for firms where $F + .3E$ is not significantly greater than G . For a firm as well funded, and with as much equity as IBM, the PBGC does not care about funding policy; the probability is close to one that $F + .3E$ (about \$26 billion for IBM) will remain above G (approximately \$2 billion for IBM). For other firms, however, a decrease in interest rates and in the stock market could create a large liability for the PBGC. For these firms, the PBGC could require that plan assets be used to “hedge” the *guaranteed benefits*. Because the guaranteed benefits are almost entirely annuities and deferred annuities, the appropriate hedge appears to be long-term bonds with a duration similar to that of the pension liabilities.

Second, the rules could be changed for funding benefits that arise from amending the pension plan. Hourly plans are able to remain perpetually underfunded because each time the fixed nominal pension benefits are increased, the increase is funded over a period of 10–30 years, while the benefits are guaranteed over a period of only 5 years. With this rule, a firm may be able to increase its unfunded guaranteed benefits perpetually. If not immediately, then, firms could be required to fund benefits over 5 years, and at the same rate as the benefits become guaranteed.

Third, consolidating plans within a firm reduces the risk of plan terminations. That is, if a plan were terminated with insufficient assets within the plan (e.g., a plan for hourly workers), the PBGC could have the right to consolidate other plans within the firm (e.g., an overfunded salaried plan).

With so many plans in good financial health, these changes would have a minimal short-term effect on most firms. By adopting these safeguards now, however, the PBGC can dramatically reduce its potential for disaster in the future.

Notes

1. For union plans, we include only single-employer plans. Thus, plans run by the union, multiemployer plans, are excluded in the analysis. We assume that all benefits are vested, and we ignore that workers accrue benefits and become vested only after a number of years of employment with the firm. Although vested benefits are assumed to be paid in a lump sum at retirement, most pension plans have insurance features in that workers receive monthly payments for life. We assume that an insurance company sells a guaranteed life annuity to the firm.

2. It is uncertain why union representatives preferred to negotiate the sharing of the difference between $M + F$ and $P + F$, in part, as $V > F$. It may be that as long as the union controlled the process of bargaining this was an efficient mechanism to transfer ownership rights of the human capital of the group, a transfer to the younger workers who assume the rights for the future. Older workers and union representatives might skew benefits to themselves, yet this might have been efficient if younger workers and older workers had worked this out as a way to transfer these ownership rights. Changes in the rate of interest may affect the value of the "loans" through changes in V as the transfers took place; however, the firm may not have been involved directly. (See Bulow and Scholes, *Who Owns the Assets in a Defined-Benefit Pension Plan?*, this volume.)

3. Expanding on 2, if sharing includes an underfunded pension plan, employers were not at a competitive disadvantage because they lost tax benefits. The employees, in part, owned "stock" in the firm through their share of the difference between M and P . If the assets of a pension fund include the stock of the firm employing the workers, as in this case, there is no tax disadvantage to an underfunded pension plan. This follows, because dealings in the firm's stock for corporate purposes, sales and repurchases, do not result in any tax at the corporate level—the stockholders earn the before-tax rate of return on dealings in their own stock.

4. The PBGC considers accrued benefits to be the same as vested benefits; it assumes that everyone in the fund is fully vested on joining the plan. This treatment differs from the Financial Accounting Standard Board rules, which require a probability weighting on the vesting of benefits, an expected value calculation. For most plans, the difference is small in this accounting treatment. Maximum benefits are nominal benefits, limits that are set each year with changes in social security benefits. If workers in a plan that terminates in 1982 receive the maximum guaranteed benefit, approximately \$1380 per month, they will receive \$1380 per month on retirement, whether it is next year or 20 years hence. The maximum benefit is raised each year and applies only to plans that terminate in that year.

Comment Richard J. Zeckhauser

Imagine a board game called Pensions. Some players represent firms, others are unionized workers, still others are nonunionized workers. One woebegone soul would be assigned to play the part of the Pension Benefit Guaranty Corporation (PBGC), whose behavior is constrained by rules defined by Congress in ERISA. The principal contribution of Bulow,

Richard J. Zeckhauser is professor of political economy, John F. Kennedy School of Government, Harvard University, and research associate, National Bureau of Economic Research.

Scholes, and Menell is to devise such a game and provide a strategy manual for it.

Pensions employs real concepts, such as human capital and defined-benefit contribution plans. Its chance cards represent actual events, such as the Chrysler bail-out and the coerced purchase of city bonds by New York municipal workers. And the game, as played according to the clearly formulated strategies of the authors, highlights important forces and tendencies in the real world.

The central lesson in their strategy manual is a simple one: When you provide insurance, as ERISA does for defined-benefit pension liabilities, moral hazard will generate more of the insured-against event, in this case pension defaults. Underfunding is linked to such defaults as fast driving is to auto accidents. Unexpected low interest rates, which raise the present value of future liabilities, parallel unexpectedly slippery weather conditions. There is even the possibility of deliberate plan terminations reminiscent of arson for insurance.

How have the players been doing? The authors are quite clear. ERISA endowed the PBGC with a disastrous set of permissible strategies. In terms of expected value, the guarantees associated with the passage of ERISA represent a vast windfall for the beneficiaries of underfunded pension plans. Companies and workers were given an entitlement to gang up on the Pension Benefit Guaranty Corporation. Firms would terminate their plans, and their employees would promise not to think less well of the firm. Stockholders, so the authors tell us, also contributed to this windfall. Some lost substantial portions, up to 30% of their equity value. Like the financial press, these equity holders were naive about the implications of ERISA; few even lobbied hard against its passage. In the event, ERISA and its captive partner the PBGC have been fortunate. A chance card led to an unexpected period of sustained high interest rates. The present values of the liabilities in defined-benefit pension plans have been dramatically reduced, removing (temporarily) the incentive for strategic terminations of underfunded plans.

Because of that chance card, the authors' predictions of calamities for the PBGC, vast shuffles of wealth, strategic terminations of pension plans, and the like cannot be verified. Alas for science. That card also provides the authors a defense against the charge of Chicken Littledom.

The authors suggest some changes in the operations of the Pension Benefit Guaranty Corporation that will "dramatically reduce its potential for disaster." The basic principle they espouse is stricter standards. They prescribe mechanisms to police the portfolios of firms, requiring the funding of benefits over shorter times and the consolidation of plans within a firm should a termination be proposed.

The PBGC probably could enforce such provisions, were they law, though the administrative overhead would be substantial. In any crucial

case, it is doubtful whether it could be as stringent as it would like to pretend it would be. It is highly unlikely that a company in trouble, with a pension plan in trouble, would ever be forced into a still more precarious state by a government agency requiring it to put more money into pension assets. With the government as pension guarantor, the workers and management constitute a natural alliance whose primary purpose would be to gain relief from requirements to reduce underfunding. As the Chrysler experience illustrates, such an alliance would be politically powerful in times of crisis.

Should the PBGC enforce these provisions? I would argue probably not, for three reasons. First, the level and manner of pension funding have significant consequences for the operation of capital markets. These proposals would constitute one more intervention in such markets, imposing possibly stringent regulations yet ignoring a most important area of consequence, namely, their effect on capital flows. Second, the heterogeneity of conditions among firms and workers, which the authors describe insightfully, suggests that pricing, not regulation, should be the preferred mechanism for ensuring the solvency of pension funds. Pricing, which responds continuously to all conditions in a pension fund, will influence all decisions affecting all pension funds, whether over- or underfunded. Regulation, in contrast, only influences funds close to not meeting the required standards. Third, the proposed provisions ignore the issue of what entity is best suited to oversee pension funds. With a pricing solution, firms would have to convince competing insurers, not regulatory authorities, that an investment approach or funding strategy is secure. Even if political realities are such that the government must remain the insurer of pension solvency, a pricing approach would seem far superior to regulation.

Bulow, Scholes, and Mennell, experts in finance, create a game defined almost exclusively in terms of the financial provisions and inducements of the pension regulatory system. If there were security markets for pension entitlements and liabilities, this game might well capture the salient elements of the real world, for a few experts could reap a fortune bringing the pensions market into equilibrium. Equilibrium would thus be assured. In fact, pension entitlements are not traded and liabilities are bundled with the other assets and liabilities of the firm. The real pensions game depends on the behavior of participants, who focus, at times myopically, on surface manifestations, such as effects on labor markets and reputations, in part because that is where other participants are looking.

References

- Arnott, R., and Gersovitz, M. 1980. Corporate financial structure and the funding of private pension plans. *Journal of Public Economics* 7 (April): 231-47.
- Barnow, B., and Ehrenberg, R. 1979. The costs of defined benefit pension plans and firm adjustments. *Quarterly Journal of Economics* 93 (November): 523-40.
- Black, F. 1980. The tax consequences of long-run pension policy. *Financial Analysts Journal* (July/August), 3-10.
- . 1976. The investment policy spectrum. *Financial Analysts Journal* (January/February), 23-31.
- Bulow, J. 1979. Analysis of pension funding under ERISA. NBER Working Paper no. 402.
- . 1982. What are corporate pension liabilities? *Quarterly Journal of Economics* 97 (August): 435-52.
- . 1981. Pension funding and investment policy. Stanford University Working Paper, October.
- Feldstein, M., and Summers, L. 1979. Inflation and the taxation of capital income in the corporate sector. *National Tax Journal* 32 (December): 445-70.
- Feldstein, M., and Seligman, S. 1981. Pension funding, share prices, and national savings. *Journal of Finance* 36 (September): 801-24.
- Goodman, H.; Munn, F.; Phillips, A.; and Vasarhelyi, M. 1981. *Illustrations and analysis of disclosures of pension information*. Financial Report Survey 22. New York: American Institute of Certified Public Accountants.
- Inman, Robert. 1980. Public pensions, public unions, and the local labor budget. NBER Summer Institute Paper no. 80-9, December.
- McGill, D. 1977. *Fundamentals of private pension*. Homewood, Ill.: Irwin.
- Miller, M. 1977. Debt and taxes. *Journal of Finance* 32 (May): 261-275.
- Miller, M., and Scholes, M. 1981. Pension funding and corporate valuation. University of Chicago Working Paper.
- Pension Benefit Guaranty Corporation. 1976. Premium requirements for the singles employer basic benefits insurance program. Part II.
- Sharpe, W. 1976. Corporate pension funding policy. *Journal of Financial Economics* 3 (June): 183-93.
- Tepper, I. 1981. Taxation and corporate pension policy. *Journal of Finance* 36 (March): 1-13.
- Tepper, I., and Affleck, A. 1974. Pension plan liabilities and corporate financial strategies. *Journal of Finance* (December): 1549-64.
- Treynor, J. 1977. The principles of corporate pension finance. *Journal of Finance* 32 (May): 627-38.
- Treynor, J.; Regan, P.; and Priest, W. 1976. *The financial reality of pension funding under ERISA*. Homewood, Ill.: Dow Jones-Irwin.